

CLAIMS:

1. Digital transmission system having a transmitter and a receiver for transmitting and receiving a digital audio signal, the digital audio signal being in the form of samples of a specific wordlength and occurring at a specific sampling rate, the transmitter comprising

5 - input means for receiving the digital audio signal and for receiving a first information word having a relationship with the specific wordlength and a second information word having a relationship with the specific sampling rate,

- formatting means for combining the digital audio signal and the first and second information words into a serial datastream suitable for transmission via a transmission medium, the wordlength of the samples in the digital audio signal, expressed in number of bits, being equal to  $n$ , where  $n$  is an integer larger than zero, and the sampling rate being equal to  $2^p \cdot F_s$ , where  $p$  is an integer larger than zero and  $F_s$  is equal to a frequency value taken from a group of at least two frequency values, said group of frequency values including 44.1 kHz and 48 kHz.

15 2. Digital transmission system as claimed in claim 1, wherein  $F_s$  is equal to a frequency value taken from a group of at least three frequency values, said group of frequency values including 32 kHz, 44.1 kHz and 48 kHz.

3. Digital transmission system as claimed in claim 1 or 2, wherein the formatting means comprises channel encoding means for channel encoding at least the digital audio signal so as to obtain said serial datastream.

20 4. Digital transmission system as claimed in claim 1 or 2, wherein the formatting means comprises error correction encoding means for error correction encoding at least the digital audio signal so as to obtain said serial datastream.

5. Digital transmission system as claimed in claim 1, 2, 3 or 4, wherein the transmitter further comprises a sigma-delta modulator and at least one lowpass filter and down sampler unit, the sigma-delta modulator being adapted to receive an analog audio signal and for supplying a 1-bit bitstream audio signal in response thereto, the at least one lowpass filter and down sampler unit being adapted to down sample the 1-bit bitstream signal so as to obtain a down sampled digital audio signal, and for supplying the down sampled

digital audio signal to the input means.

6. Digital transmission system as claimed in claim 5, wherein the lowpass filter and downsampler unit realizes a down sampling with a factor  $2^r$ , where  $r$  is an integer larger than zero.

5 7. Digital transmission system as claimed in anyone of the preceding claims, wherein the receiver comprises

- input means for receiving the serial datastream from the transmission medium,  
- retrieval means for retrieving the first and second information words from the serial datastream, for retrieving the digital audio signal from the serial datastream using the first  
10 information word,

- sample rate conversion means for converting the sampling rate of the samples in the digital audio signal supplied by the retrieval means from the sampling rate defined by the second information word into a second sampling rate so as to obtain an in sample rate converted digital audio signal, wherein the second sampling rate is equal to  $2^q \cdot F_s'$ , where  $q$  is an  
15 integer larger than zero and  $F_s'$  is equal to a frequency value taken from a group of at least two frequency values, said group of frequency values including 44.1 kHz and 48 kHz, the samples in said in sample rate converted digital audio signal having a specific wordlength, and

- output means for supplying the in sample rate converted digital audio signal at said second  
20 sampling rate.

8. Digital transmission system as claimed in claim 7, wherein  $F_s'$  equals 48 kHz.

9. Digital transmission system as claimed in claim 7 or 8, wherein the receiver further comprises D/A conversion means for converting the in sample rate converted  
25 digital audio signal into an analog audio signal.

10. Digital transmission system as claimed in claim 7, 8 or 9, wherein the sample rate conversion means comprise

- upsampling means for upsampling the digital audio signal so as to obtain an upsampled digital audio signal having a sampling rate equal to  $2^q \cdot F_s$ ,

30 - variable hold means for variably holding the samples of the upsampled digital audio signal so as to obtain the in sample rate converted digital audio signal.

11. Digital transmission system as claimed in anyone of the claims 7 to 10, wherein the input means comprise channel decoding means for channel decoding the serial datastream.

12. Digital transmission system as claimed in anyone of the claims 7 to 10, wherein the input means comprise error correction means for carrying out an error correction step on a signal applied to the input of the error correction means.

13. Transmitter for use in a transmission system as claimed in anyone of the  
5 claims 1 to 6, characterized by those features in the claims 1, 2, 3, 4, 5 or 6 that characterize the transmitter.

14. Transmitter as claimed in claim 13, wherein the transmitter is in the form of a recording apparatus for recording the serial datastream in a track on a record carrier, the formatting means further comprising writing means for writing the serial datastream in said  
10 track on the record carrier.

15. Receiver for use in a transmission system as claimed in anyone of the claims 7 to 12, characterized by those features in the claims 7, 8, 9, 10, 11 or 12 that characterize the receiver.

16. Receiver as claimed in claim 15, wherein the receiver is in the form of a reproducing apparatus for reproducing the serial datastream from a track on a record carrier, the input means further comprising reading means for reading the serial datastream from said track on the record carrier.

17. Record carrier obtained with the transmitter as claimed in claim 14, a serial datastream being recorded in a track on said record carrier, said serial datastream comprising samples of a digital audio signal and a first and a second information word included in said serial datastream, the first information word having a relationship with the wordlength of the samples in said digital audio signal and the second information word having a relationship with the sampling rate of the samples in said digital audio signal, the wordlength of the samples in the digital audio signal, expressed in number of bits, being  
20 equal to  $n$ , where  $n$  is an integer larger than zero, and the sampling rate of the samples in the digital audio signal being equal to  $2^p \cdot F_s$ , where  $p$  is an integer larger than zero and  $F_s$  is equal to a frequency value taken from a group of at least two frequency values, said group of frequency values including 44.1 kHz and 48 kHz.

18. Method of transmitting a digital audio signal, the digital audio signal  
30 being in the form of samples of a specific wordlength and occurring at a specific sampling rate, the transmission method comprising the steps of

- receiving the digital audio signal
- receiving a first information word having a relationship with the specific wordlength and a second information word having a relationship with the specific sampling rate,

- combining the digital audio signal and the first and second information words into a serial datastream suitable for transmission via a transmission medium, the wordlength of the samples in the digital audio signal, expressed in number of bits, being equal to  $n$ , where  $n$  is an integer larger than zero, and the sampling rate being equal to  $2^p \cdot F_s$ , where  $p$  is an integer larger than zero and  $F_s$  is equal to a frequency value taken from a group of at least two frequency values, said group of frequency values including 44.1 kHz and 48 kHz.

19. Transmission signal comprising samples of a digital audio signal and a first and a second information word, the first information word having a relationship with the wordlength of the samples in said digital audio signal and the second information word having a relationship with the sampling rate of the samples in said digital audio signal, the wordlength of the samples in the digital audio signal, expressed in number of bits, being equal to  $n$ , where  $n$  is an integer larger than zero, and the sampling rate of the samples in the digital audio signal being equal to  $2^p \cdot F_s$ , where  $p$  is an integer larger than zero and  $F_s$  is equal to a frequency value taken from a group of at least two frequency values, said group of frequency values including 44.1 kHz and 48 kHz.

20. Transmission system as claimed in claim 7, wherein the transmitter further comprises lossless compression means for carrying out a substantially lossless data compression step on the digital audio signal so as to obtain a data compressed digital audio signal for transmission via the transmission medium, the receiver further comprising lossless expansion means for carrying out a data expansion step on the data compressed digital audio signal in the transmission signal so as to obtain a replica of the digital audio signal.